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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,912	12/16/2003	Seung-Chul Choi	040021-0306769	3859

909 7590 09/07/2006

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EXAMINER	
LUND, JEFFRIE ROBERT	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,912	CHOI, SEUNG-CHUL	
	Examiner	Art Unit	
	Jeffrie R. Lund	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 does not further limit claim 1, because the limitation of claim 1 requires that distance be increased as the time to form the deposition layer elapses, while claim 4 only requires that the distance be increased. Thus, the limitation of claim 4 is broader than the limitation of claim 1.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 6, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Basceri et al, US Patent Application Publication 2002/0132374 A1.

Basceri et al teaches a deposition apparatus that includes: a process chamber 50; a gas supply assembly 72 in a first end of the process chamber; a chuck 66 configured to support a wafer 10; a vacuum pump 70 connected to exhaust port located

in a second end of the processing chamber, opposite the gas supply assembly; a position control assembly (represented by arrows 85) for raising and lowering the chuck; and a controller (not shown see paragraph 0054 to control the position control assembly such that the distance between the wafer and the gas assembly is varied during the deposition process. (Figure 3) Basceri et al also teaches that the chuck can be raised and lowered during the deposition process to control the stoichiometry of the deposited layer. In paragraph 0038 Basceri et al teaches continually increasing the concentration of Ti in the layer from the lower edge 13 to the top edge 15. In paragraph 0053 Basceri et al teaches that when D (the distance between the chuck and the gas supply assembly) is decreased the amount of Ti in the layer decreases. Therefore, in order to continually increase the Ti concentration, the distance between the chuck and gas supply assembly must be continually increased.

4. Claims 1, 4, 6, and 7 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ingle et al, US Patent 6,905,940 B2.

Ingle et al teaches a CVD apparatus that includes: a process chamber 15; a gas supply assembly 20; a chuck 25 configured to support a wafer; a vacuum pump 88; a position control assembly for raising and lowering the chuck; and a controller 53 to control the position control assembly 160 such that the distance between the wafer and the gas assembly is varied during the deposition process. (Entire document, specifically figure 1A, 1D, 5; and column 12 lines 48-64) Ingle et al also teaches that changing the distance between the chuck and gas supply assembly, changes the deposition rate. The

specific operation of the position control assembly is an intended use of the apparatus. The position control assembly is capable of increasing the distance between the gas supply assembly and the chuck in any number of stages (positions) or in a continuous manner.

Alternately, it would be obvious to one of ordinary skill in the art to optimize the movement of the chuck to optimize the deposition rate or improve the conformal characteristics of the layer as taught by Ingle et al.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2, 3, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basceri et al, US Patent Application Publication 2002/0132374 A1, in view of Mitani et al, JP 3-281780.

Basceri et al was discussed above.

Basceri et al differs from the present invention in that Basceri does not teach that the gas supply assembly is divided into a center and outer portions each connected to a process gas line; a valve in the process gas line attached to the outer portion; and controlling the valve.

Mitani et al teaches a processing apparatus that includes a gas supply assembly divided into a center section 21 and an outer section 22, 23, and the center and outer

sections are connected to a process gas line with a valve 44, 54. (Entire document, specifically, figures 4 and 5)

The motivation for dividing the gas supply assembly of Basceri et al and providing valves to control the gas flow into each section is to more accurately control the flow of gas into the processing chamber through out the deposition process, which results in a more uniform deposited layer as taught by Mitani et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the gas supply assembly of Basceri et al as taught by Mitani et al.

7. Claims 2, 3, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle et al, US Patent 6,905,940 B2, in view of Mitani et al, JP 3-281780.

Ingle et al was discussed above.

Ingle et al differs from the present invention in that Ingle does not teach that the vacuum pump is opposite the gas supply assembly; that the gas supply assembly is divided into a center and outer portions each connected to a process gas line; a valve in the process gas line attached to the outer portion; and controlling the valve.

Mitani et al teaches a processing apparatus that includes a gas supply assembly divided into a center section 21 and an outer section 22, 23, the center and outer sections connected to a process gas line with a valve 44, 54; and the vacuum pump 49, 410, 512, 513 is opposite the gas supply assembly. (Entire document, specifically, figures 4 and 5)

The motivation for dividing the gas supply assembly of Ingle et al and providing

valves to control the gas flow into each section is to more accurately control the flow of gas into the processing chamber through out the deposition process, which results in a more uniform deposited layer as taught by Mitani et al.

The motivation for moving the vacuum of Ingle to opposite the gas supply assembly is to provide an alternate and equivalent gas flow as taught by Mitani et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the gas supply assembly, and to move the vacuum pump of Ingle et al as taught by Mitani et al.

Response to Arguments

8. Applicant's arguments regarding Toshima et al, see pages 5-7 of the "REMARKS", filed June 22, 2006, with respect to the 102 rejection of claims 1 and 2 under Toshima et al have been fully considered and are persuasive. The 102 rejection of claims 1 and 2 has been withdrawn.

9. Applicant's arguments with respect to claims 1-4, and 6-8 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed June 22, 2006 have been fully considered but they are not persuasive.

In regard to the argument that Ingle et al teaches decreasing the distance between the gas supply assembly and the chuck, the Examiner agrees. However, the use of the apparatus of Ingle et al is not limited by a use disclosed in Ingle et al; the control of the position control assembly is an intended use of the apparatus; and Ingle et al teaches that varying the distance between the gas supply assembly and chuck

changes the deposition rate and the conformal characteristics of the layer. The controller is capable of directing the position control assembly to move the chuck in a wide variety of patterns to perform a variety of processes. The apparatus of Ingle et al is capable of increasing the distance. Therefore, Ingle et al meets all the requirements of the claimed invention.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

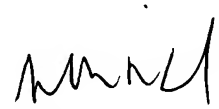
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
9/4/06